

What we claim is:

1. A method for operating a computer network so as to provide a multiplicity of users access to a multiplicity of applications, the applications each including data, the network having one or more host computers, a plurality of concentrator computers connected in groups of one or more to each of the host computers, and a plurality of reception system computers at which respective users may request applications, the reception system computers being connected in groups of one or more to each of the concentrator computers, the method comprising the steps of:

a. establishing data stores at the host computers, the concentrator computers and the reception system computers;

b. distributing application data in accordance with a predetermined plan to data stores maintained, respectively, at the host computers, the concentrator computers and the reception system computers; and

c. supplying application data to a respective reception system computer at which an application is requested so that the respective reception system computer can assemble the data which makes up the requested application by selectively collecting data from its own data store and the data stores of the respective host computer and concentrator computer to which it is connected.

2. The method of claim 1 wherein in collecting data for generating the requested applications, the respective reception system determines if the requested application can be constituted from data stored at the respective reception system, and to the extent it is determined that required data is not stored at the respective reception system, requesting the required data from the network.

3. The method of claim 2 wherein distributing data within the network includes placing data depending upon the likelihood the application associated with the data will be requested so that data required for an application likely to be requested is likely to be located at the respective reception system computer and data required for applications least likely to be requested is not likely to be located at the respective reception computer.

1 4. The method of claim 3 wherein distributing the data within the
2 network includes placing data depending in part upon preferences of
3 the user of the respective reception system computer.

1 ²5. The method of claim ¹4 wherein distributing data within the
2 network depends in part upon user preferences determined from
3 application requests of users.

1 ³6. The method of claim ²5 wherein supplying data to the respective
2 reception system computer at which and application request is made
3 includes downloading data from the network to the respective reception
4 system when it logs onto the network so as to maintain the store of
5 data at the respective reception system computer current.

1 ⁴7. The method of claim ¹3, wherein data is stored in the network
2 in accordance with a control attribute provided with the data that
3 indicates currency.

1 ⁵8. The method of claim ⁴7, wherein the data is stored in
2 accordance with an additional control attribute provided with the data
3 that indicates data permanency.

1 ⁶9. The method of claim ⁵8, wherein data is stored during user
2 sessions according to the control attributes associated with the
3 respective data.

1 10. A method for operating a computer network having a
2 multiplicity of reception systems at which respective users can
3 request applications that include interactive services, the method
4 comprising the steps of:

5 a. organizing the applications into objects that
6 collectively include data and executable program instructions for
7 generating the applications;

8 b. distributing selected objects in accordance with a
9 predetermined plan within the network; and

10 c. supplying objects to a respective reception system
11 computer at which an application is requested to enable the respective
12 reception system computer to selectively collect objects required for

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13 the application from the network and the respective reception system
14 so that the requested application may be presented based on the
15 objects collected.

1 11. The method of claim 10 wherein collecting objects includes
2 execution of application software operating at the respective
3 reception system which is capable of interpreting the program
4 instructions included in the objects.

1 12. The method of claim 11 wherein the organization of the
2 applications into objects includes structuring the objects to include
3 a first section having information for processing the object and a
4 second section including one or more subunits of information including
5 the presentation data and program instructions for executing the
6 object.

1 13. The method of claim 12 wherein in collecting objects for
2 presenting the requested applications, the respective reception system
3 application software determines if the requested application can be
4 constituted from objects stored at the respective reception system and
5 to the extent it is determined that objects not stored at the
6 respective reception system are required, requesting the required
7 objects from the network.

1 14. The method of claim 13 wherein the organizing of the
2 applications into objects includes providing the program instructions
3 necessary to execute the requested application in a high-level
4 language having verbs adapted to be interpreted by the application
5 software maintained at the respective reception system.

1 15. The method of claim 14 wherein the supplying of objects to
2 the respective reception system includes the supply of information
3 other than objects, and wherein such other information includes
4 messages.

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1 16. The method of claim 15 wherein the supplying of messages
2 includes structuring the messages to have a first section including
3 information for processing the message, and at least a second section
4 including information representing the message.

1 17. The method of claim 16 wherein distributing the objects
2 within the network includes placing objects depending upon the
3 likelihood that its associated application will be requested so that
4 objects for applications likely to be requested are likely to be
5 placed at the respective reception system computer and objects for
6 applications least likely to be requested are not likely to be placed
6 at the respective reception system.

1 18. The method of claim 17 wherein distributing the objects
2 within the network includes placing objects depending in part upon
3 preferences of the respective reception system users.

1 19. The method of claim 18 wherein distributing objects within
2 the network depends in part upon user preference determined by user
3 previous application requests.

1 20. The method of claim 12 wherein organizing the application
2 information into objects includes formulating the objects so that they
3 can be used in one or more applications.

1 21. The method of claim 20 wherein formulating the objects
2 includes formulating the object subunits as elements that can be used
3 in one or more objects.

1 22. The method of claim 15 wherein the organizing of applications
2 into objects includes collecting the objects in sets which include the
3 information necessary to present a display to the user at a monitor
4 provided at the respective reception system, and wherein one or more
5 screens of display are used to make up an application.

1 23. The method of claim 15 wherein supplying objects to the
2 respective reception system computer includes downloading objects from
3 the network to the respective reception system when it logs onto the
4 network so as to maintain the store of objects at the respective
5 reception system computer current.

1 24. A computer network for providing a multiplicity of users
2 access to a multiplicity of applications, the applications each
3 including data, the apparatus comprising:
4

5 a. one or more host computers, each including a data store
6 containing data used in creating applications;

7 b. a plurality of concentrator computers connected in groups
8 of one or more to each of the host computers, each of the concentrator
9 computers including a data store containing data used in creating
10 applications;

11 c. a plurality of reception system computers at which
12 respective users can request applications, the reception system
13 computers being connected in groups of one or more to each of the
14 concentrator computers, the reception system computers each including
15 a data store containing data used in creating applications; and

16 d. data distribution means for distributing data in the
17 network such that data required for an application requested at a
18 respective reception system may be collected from the data store of
19 the respective reception system and the data stores of the host
20 computer and concentrator computer to which the respective reception
system is connected.

1 25. The computer network apparatus of claim 24 wherein the data
2 distribution means includes means provided at the respective reception
3 system, for determining whether the requested application can be
4 constituted from data stored at the respective reception system, and
5 to the extent it is determined that required data is not stored at the
6 respective reception system, requesting the required data from the
7 network.

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1 26. The computer network of claim 25 wherein data distribution
2 means further includes means for maintaining data at the data stores
3 of the network dependent upon the likelihood an application associated
4 with the data will be requested so that data required for an
5 application likely to requested is likely to be located at the
6 respective reception system and data required for applications least
7 likely to be requested is not likely to be located at the respective
8 reception computer.

1 27. The computer network of claim 26 wherein the means for
2 maintaining data at the network data stores retains data dependent in
3 part upon preferences of the respective users of the requesting
4 reception systems.

1 ⁸28. The computer network of claim ⁷~~27~~ wherein the means for
2 maintaining data at the network data stores retains data dependent in
3 part upon user preferences determined from respective users previous
4 application requests.

1 ⁹29. The computer network of claim ⁸~~28~~ wherein the means for
2 distributing data includes means for downloading data from the network
3 to the respective reception systems when the respective reception
4 systems log onto the network so as to maintain the store of data at
5 the requesting reception systems current.

1 ¹⁰30. The computer network of claim ⁷~~29~~, wherein the means for
2 maintaining data retains data in accordance with a control attribute
3 provided with the data that indicate currency.

1 ¹¹31. The computer network of claim ¹⁰~~30~~, wherein the means for
2 maintaining data in the network retains data in accordance with an
3 additional control attribute provided with the data that indicates
4 data permanency.

1 ¹²32. The computer network of claim ¹¹~~31~~, wherein the means for
2 maintaining data in the network retains data at the respective
3 reception system during user sessions according to the control
4 attributes associated with the respective data.